WM-EX50/FX50

SERVICE MANUAL

US Model
AEP Model
E Model
WM-EX50/FX50

UK Model
WM-EX50

Canadian Model
WM-FX50

WM-EX50

WM-FX50

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Model Name Using Similar Mechanism		WM-2091 WM-F2095
Tape Transport Mechanism	WM-EX50 : MT-WMEX50-01	
	WM-FX50 : MT-WMFX50-01	

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CASSETTE PLAYER
WM-EX50

RADIO CASSETTE PLAYER
WM-FX50

SONY®

GENERAL

Messages, warnings and tips

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacture's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri
af samme fabrikat og type.
Lever det brugte batteri tilbage til leverand¢ren.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare.
Ved utskifting benyttes kun batteri som
anbefalt av apparatfabrikanten.
Brukt batteri retuneres apparatleverand¢ren.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens
instruktion.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

Precautions

Notes on battery

- Romove the battrey when you will not use the unit for a long time to prevent damage from battery leakage and corrosion.
- When the sound becomes unstable, try a new battery.

External power sources

The following external power sources can be connected through the DC IN 1.5V jack.

- House current using an AC-E15L AC power adaptor.

The illustration shows the polarity of DC IN 1.5V jack. Use only a power cord having the same polarity.

Test equipment,Jigs and Material

Test equipment

Digital multimeter
FM RF signal generator
AM RF signal generator
Stabilized power supply
Speed checker
Wow and Flutter
Frequency counter
VTVM
Spectrum analyzer
SONY Digital tuning radio ICF-2001 or equivalents

Jigs

Test tape	Part Number
- WS-48A (3kHz, 0dB)	7-819-032-11
Cassette type torque meter	
- CQ-102C (normal direction)	8-909-708-22
- CQ-102RC (reverse direction)	8-909-708-26
- CQ-201B (FF and REW)	8-909-708-41
Cassette type Tension meter	
- CQ-403A (normal direction)	8-909-708-92
- CQ-403R (reverse direction)	8-909-708-95

Screw locking compound

Neji lock G (1401B)	7-432-114-11

Greases and Oil

Machine oil Hydro Fruid NT-68	7-661-018-18
Sankol FG-84M	7-662-001-36

Feature

• Double Super heterodyne FM receiver for WM-FX50

The FM receiver is used the double super heterodyne system which is superior in FM sensitivity and image sprious rejection.

System comparison chart

	WM-FX50	WM-F702
Receiving system	Double super heterodyne (FM)	Single super heterodyne
Detector	Double pulse count	Quadrature
AM IF	55kHz	450kHz
FM IF	28.6MHz (1st IF) 150kHz (2nd IF)	10.7MHz
Filter element	Monolisic	Ceramic

Method of calculation

NOTE : fs = Tuned frequency

• FM local oscillator frequency

1st stage local oscillator frequency (fo)

$$f_o = f_s + \left(\frac{\text{2nd local OSC}}{2}\right) - 150\text{kHz}$$

[For Example]

Tuned at 100MHz

$$f_o = 100 + \left(\frac{57.5}{2}\right) - 150\text{kHz} = 128.6\text{MHz}$$

2nd stage local oscillator frequency

57.5MHz (fixed)

• FM image frequency

$$f_{oi1} = f_s + \left(\frac{57.5\text{MHz}}{2} - 150\text{kHz}\right) \times 2$$

$$f_{oi2} = \frac{57.5\text{MHz}}{2} + 150\text{kHz} = 28.9\text{MHz}$$

[For Example]

Tuned at 100MHz

$$f_{oi1} = 100\text{MHz} + \left(\frac{57.5\text{MHz}}{2} - 150\text{kHz}\right) \times 2$$
$$= 157.2\text{MHz}$$

$f$oi2 = 28.9MHz (Fixed)

• AM local oscillator frequency (fo)

$f_o = (f_s + 55\text{kHz}) \times 2$

[For Example]

Tuned at 1000kHz

$f_o = (1000\text{kHz} + 55\text{kHz}) \times 2 = 2110\text{kHz}$

• AM image frequency ($f$oi)

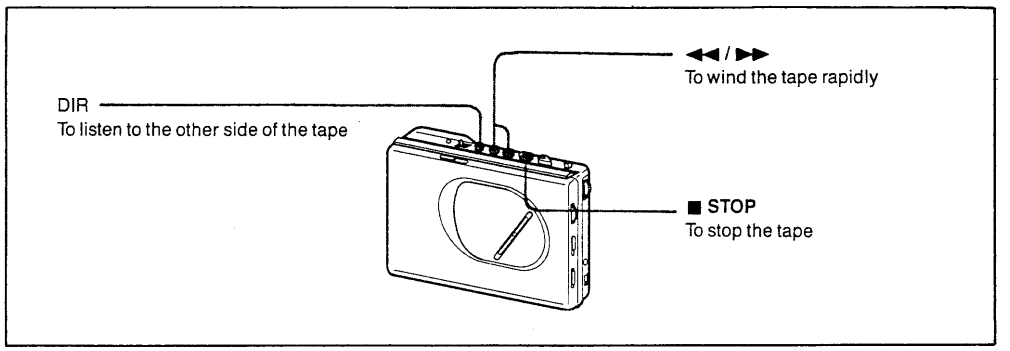
$f_{oi} = f_s + 55\text{kHz} \times 2$

[For Example]

Tuned at 1000kHz

$f_{oi} = 1000\text{kHz} + 55\text{kHz} \times 2 = 1110\text{kHz}$

Location and Function of Controls



MEGA BASS

Listening to powerful and heavy sound

Set MEGA BASS to the desired position. Bass is boosted in the order of NORM, MID and MAX.	MAX MID NORM

While playing back hard and stressed sound with MEGA BASS set to MAX, the sound may be distorted. In this case, set MEGA BASS to NORM or MID.

DOLBY NR

Getting the best performance from your tape

For Dolby NR processed tapes	ON OFF DOLBY NR

MODE

On playback operation

Playing back both sides of the cassette once When the playback starts from the reverse side of the cassette, the unit will be shut off at the end of that side.	MODE
Playing back both sides of the cassette repeatedly	MODE

TAPE

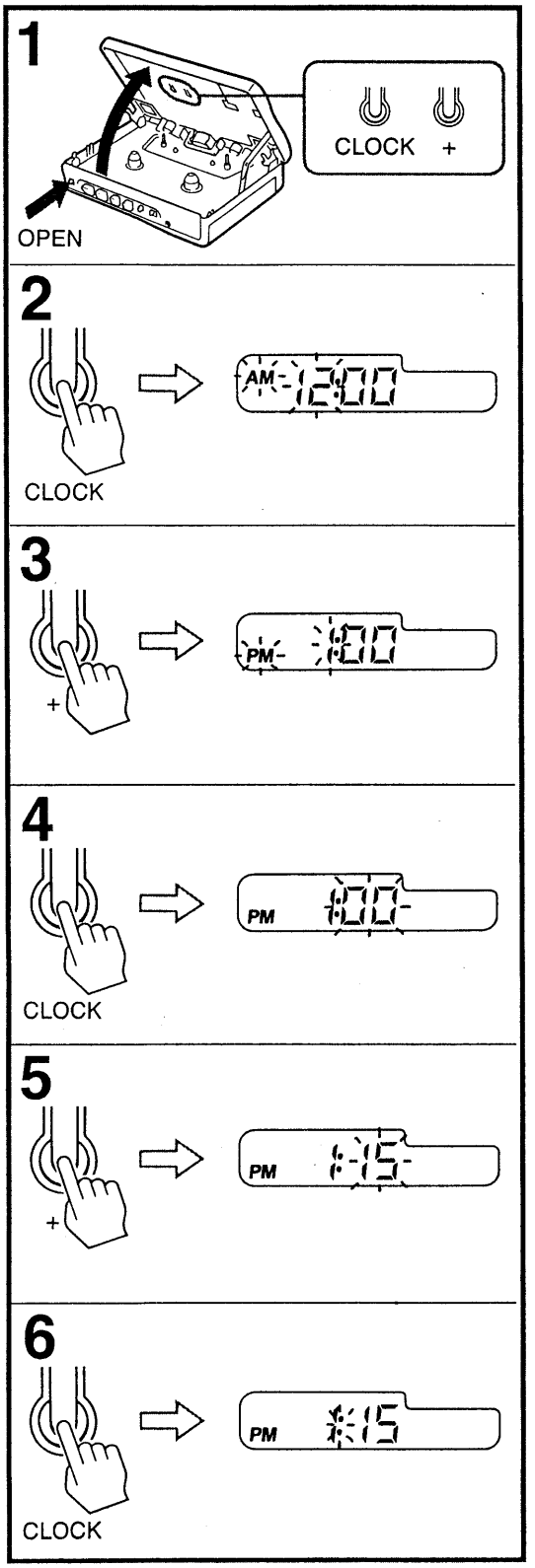
For normal (TYPE I) tapes	METAL NORM CrO_2 TAPE
For CrO_2 (TYPE II) or metal (TYPE IV) tapes	METAL NORM CrO_2 TAPE

MW-FX50 ONLY

For normal reception	LOCAL DX FM SENS	For normal reception	RADIO FM MONO FM ST TAPE (RADIO OFF)
If a very strong station signal causes noise The noise will be reduced.	LOCAL DX FM SENS	If it is hard to hear the broadcast due to noise, the noise will be reduced. In this mode, there is no stereo effect.	RADIO FM MONO FM ST TAPE (RADIO OFF)

User's Instruction

Setting the Cl ck



Before setting the clock, be sure that the clock indication appears in the LCD display window.
Ex. To set to 1:15 p.m.

1 **Press the OPEN button.**
2 **Press the CLOCK button for 1.5 seconds or more.**
3 **Set the hour.**
Press the + button repeatedly until you get the desired setting.
4 **Press the CLOCK button.**
5 **Set the minute.**
Press the + button repeatedly until you get the desired setting.
6 **Press the CLOCK button.**

Notes

- The hour display is in the 12-hour system.
- If you keep pressing the + button, the digits advance in sequence.
- The hour display does not advance even when the minute indication returns to "00" after "59".

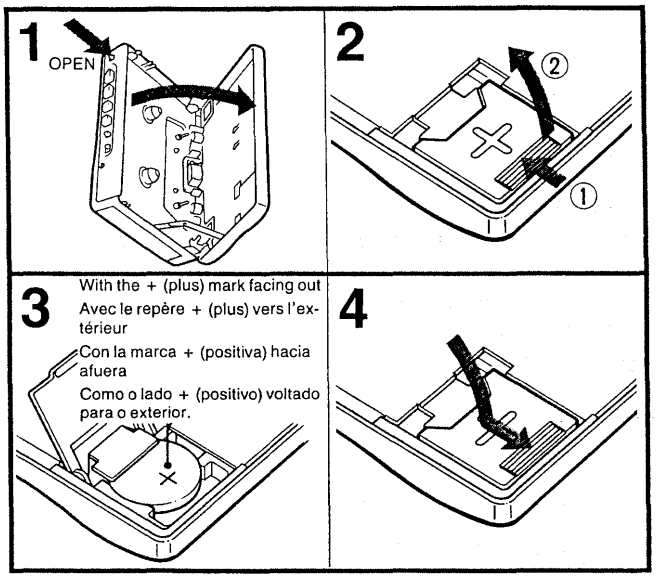
To change the hour only

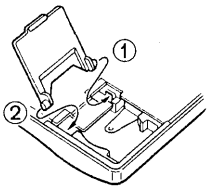
Follow steps 1 - 3, then press the CLOCK button twice. (During this operation the minutes and the seconds do not advance.)

To change the minute only

Follow steps 1 - 6 but skip step 3.
(During this operation the seconds advance.)

Inserting a Lithium Battery





Note
If the lithium battery compartment lid is detached by an accidental drop, etc. attach it as illustrated.

Before operation, be sure to install a lithium battery (supplied). With the lithium battery installed, this unit powers the clock and displays the tape operation indications in the LCD display window during the tape playback.

Lithium battery life

Approximately one year and a half in normal operation.
If the lithium battery becomes weak, the letters on the display will become indistinct. **In this case, replace the battery with a Sony CR2025 lithium battery.** Use of another battery may cause a risk of fire or explosion. After replacing the battery, reset the clock.

Cautions
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.
- Before use, wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery or throw it into a fire because it may explode. Carefully dispose of the used batteries.

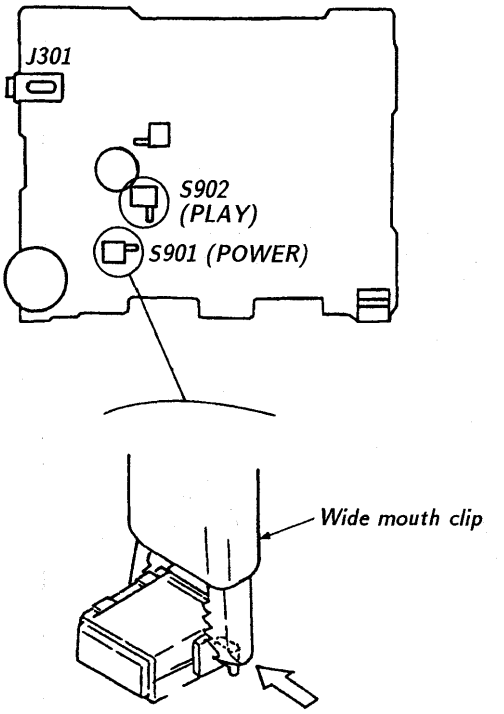
Warning
Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Service Notes

How to check the operation

When audio board has been removed from mechanical deck. Depress the PLAY (►) button to turn ON the S901 (POWER) and S902 (PLAY).

AUDIO BOARD - Component side -



Flexible Circuit Board Repairing

-Keep the temperature of the soldering iron around 270℃ during repairing.
-Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
-Be careful not to apply force on the conductor when soldering or unsoldering.

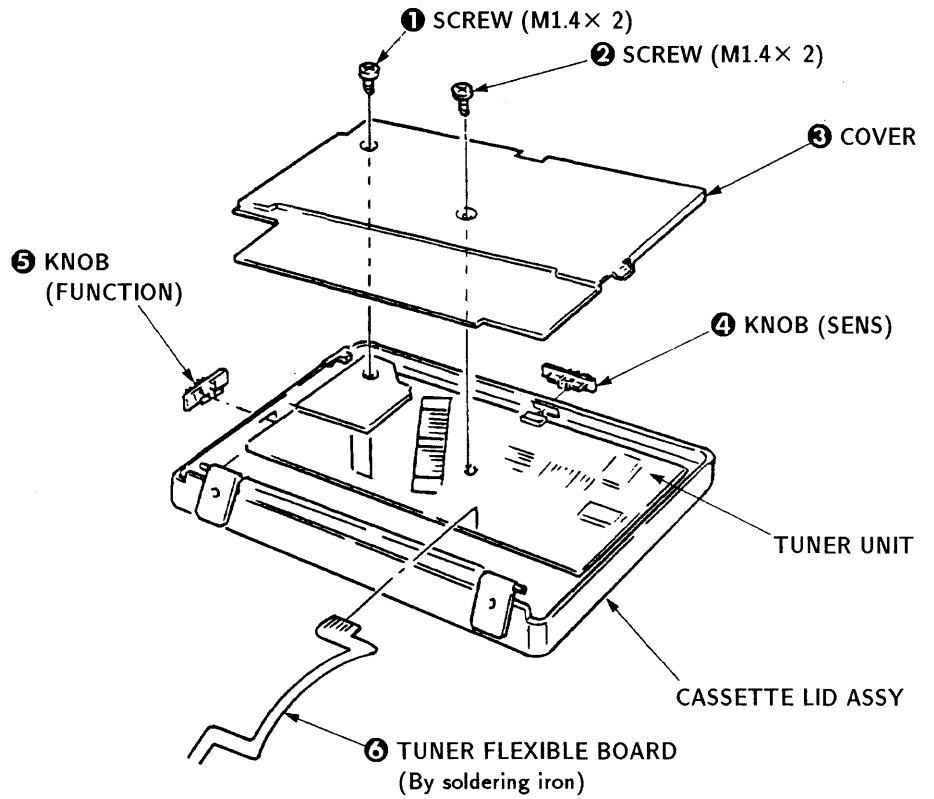
Notes on Chip Component Replacement

-Never reuse a disconnected chip component.
-Notice that the minus side of a tantalum capacitor may be damaged by heat.

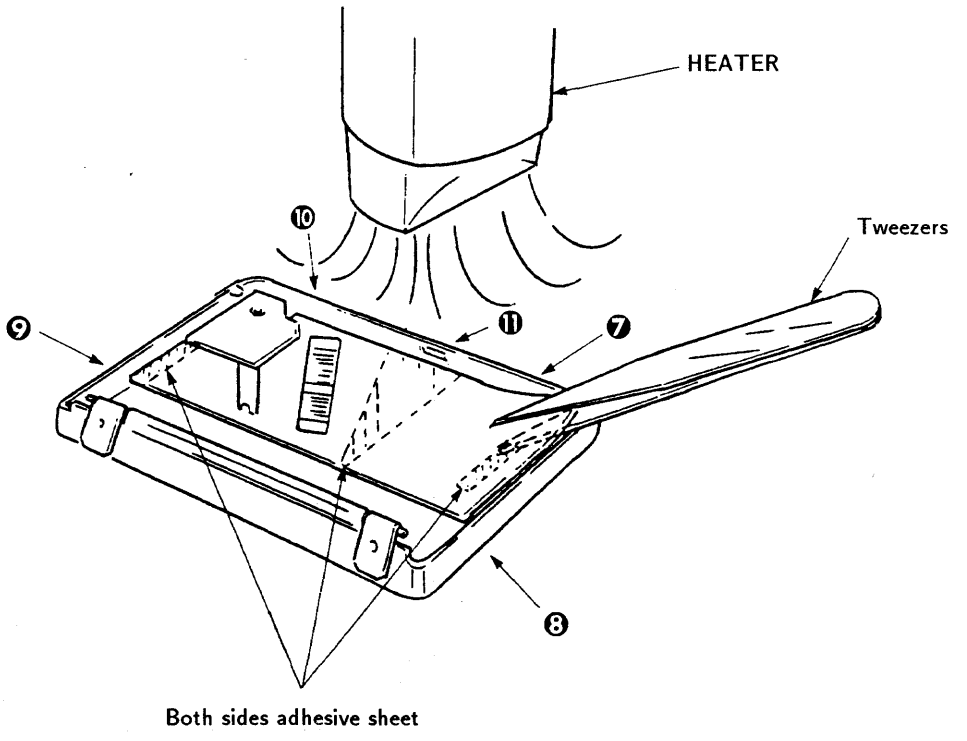
REMOVAL

Note : Follow the disassembly procedure the numerical order given.

Tuner unit (WM-FX50)



To take off the tuner unit from cassette lid ass'y.
Warm up ❼ to ⓫ portion by heater and move it slowly by tweezers.



LCD BLOCK INFORMATION

Clock operation

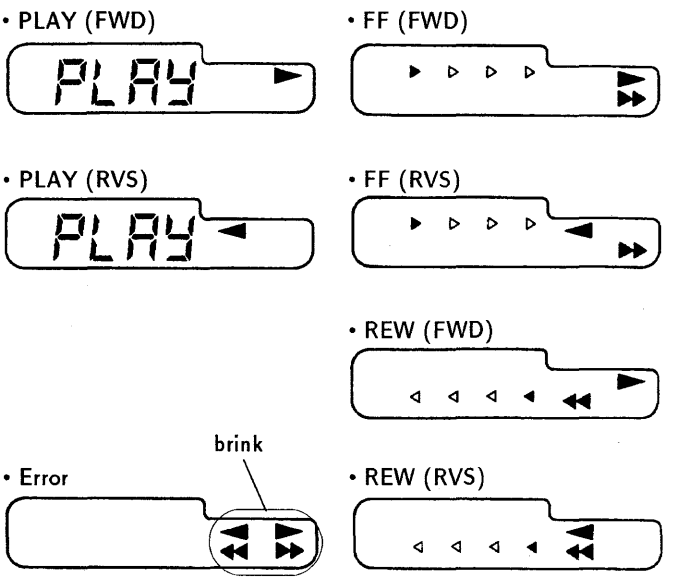
LCD will operate as a clock indication with the following conditions.

1. When the data code 0000 or 0100 feed into input port. (data code show in chart 1)
2. When the dry penlight battery (AM3/LR6) or Ni-Cd battery is not built- in the battery case.

Refer to User's instruction "Setting the clock" page 5.

Tape running indication

LCD will operate as a tape running indication mode when it assembled the data code of chart 1.



* Error indication mean's to notified to the customer that it is abnormal operation when pushing the MD button in same time.

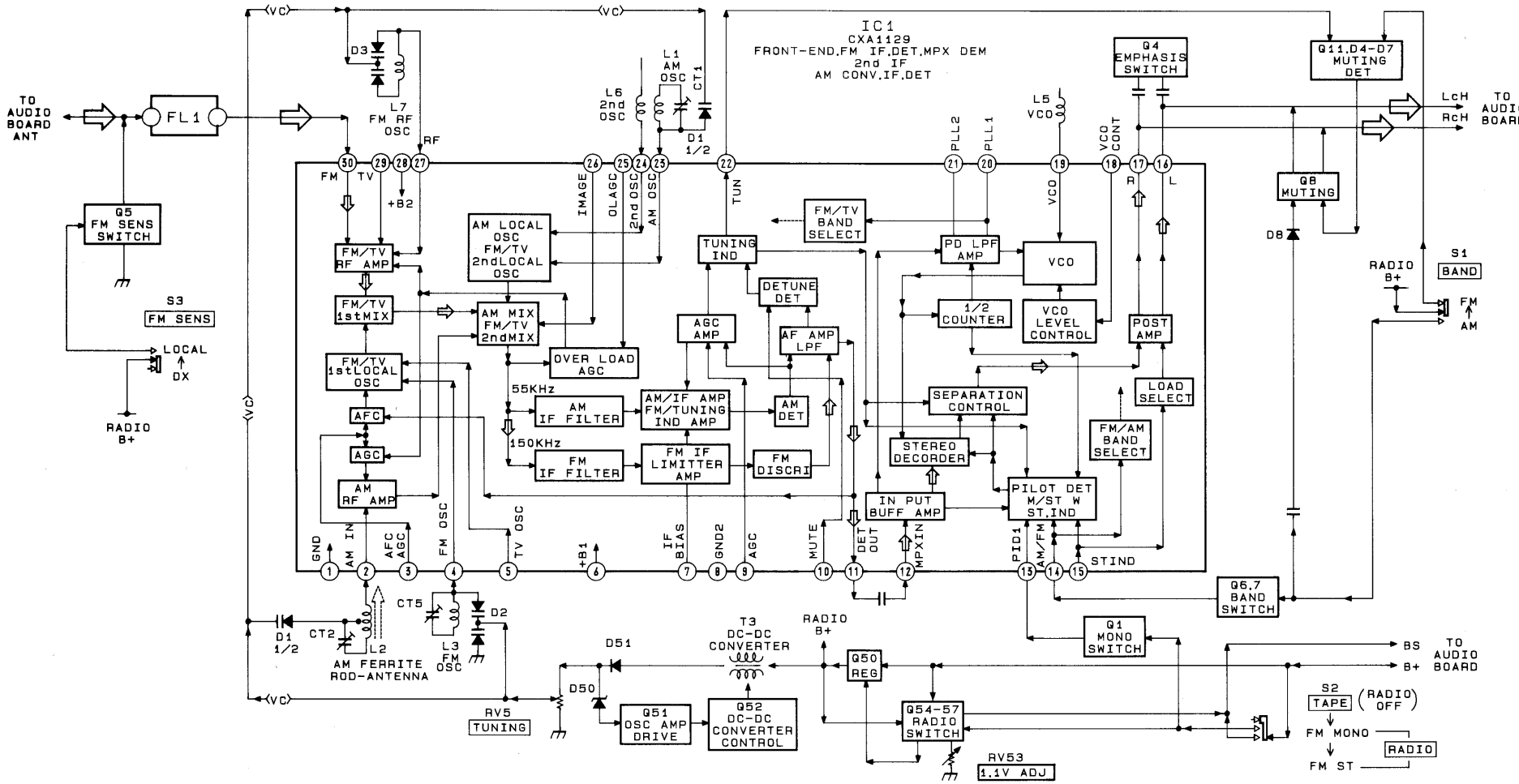
* The clock will be reset and indicate AM 12 : 00 after all indicator is light.
Indicator is clock mode when rethium battery take off.

Data code chart and indication mode

Chart 1

No.	PLAY	FWD/RVS	FF	REW	MODE
0	0	0	0	0	Clock
1	0	0	0	1	REW (RVS)
2	0	0	1	0	FF (RVS)
3	0	0	1	1	Error
4	0	1	0	0	Clock
5	0	1	0	1	REW (FWD)
6	0	1	1	0	FF (FWD)
7	0	1	1	1	Error
8	1	0	0	0	PLAY (RVS)
9	1	0	0	1	Error
A	1	0	1	0	Error
B	1	0	1	1	Error
C	1	1	0	0	PLAY (FWD)
D	1	1	0	1	Error
E	1	1	1	0	Error
F	1	1	1	1	Error

Tuner Section (WM-FX50 ONLY)

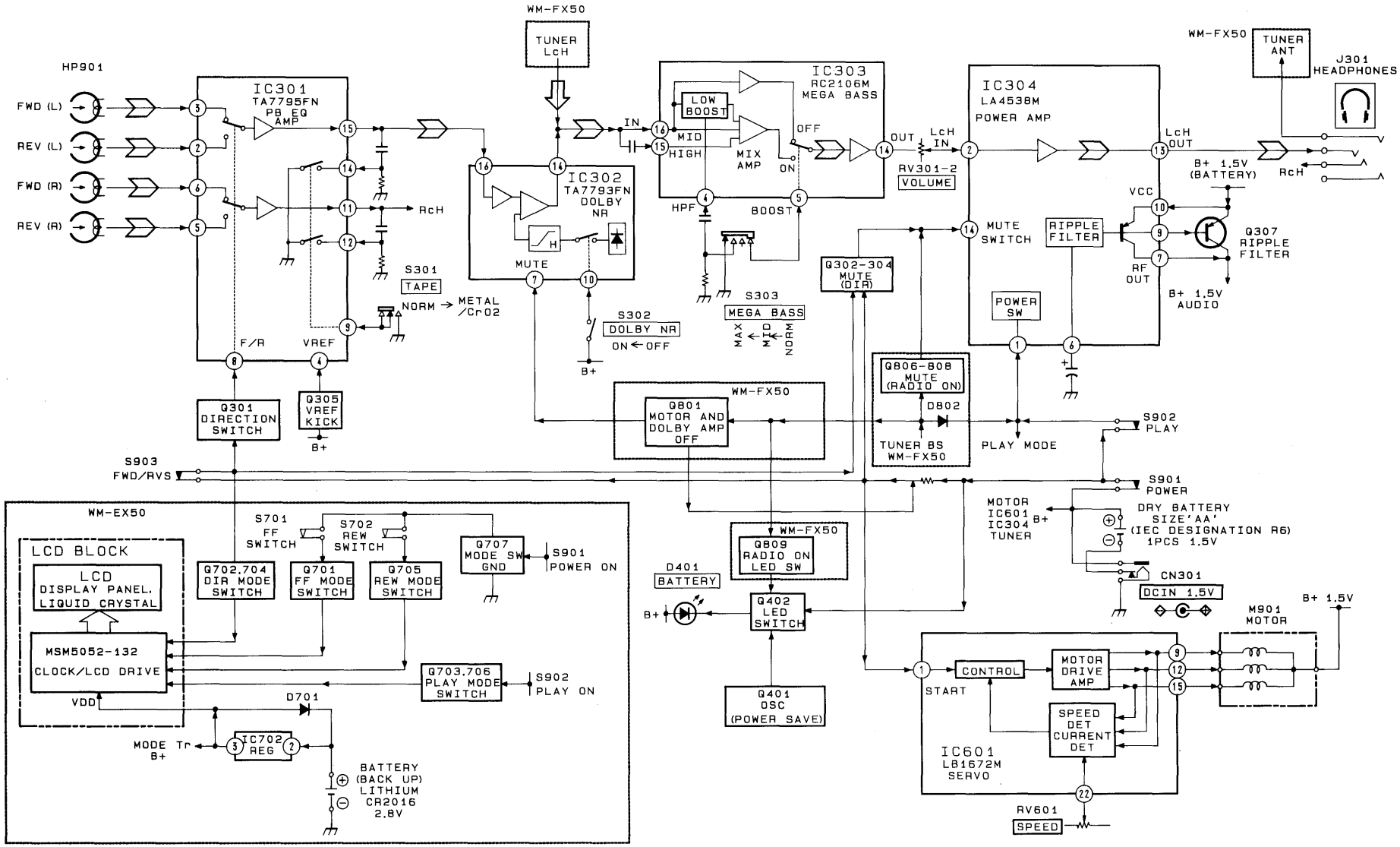


Note :

- Signal path

⇨ : FM

Audio Section



Note :

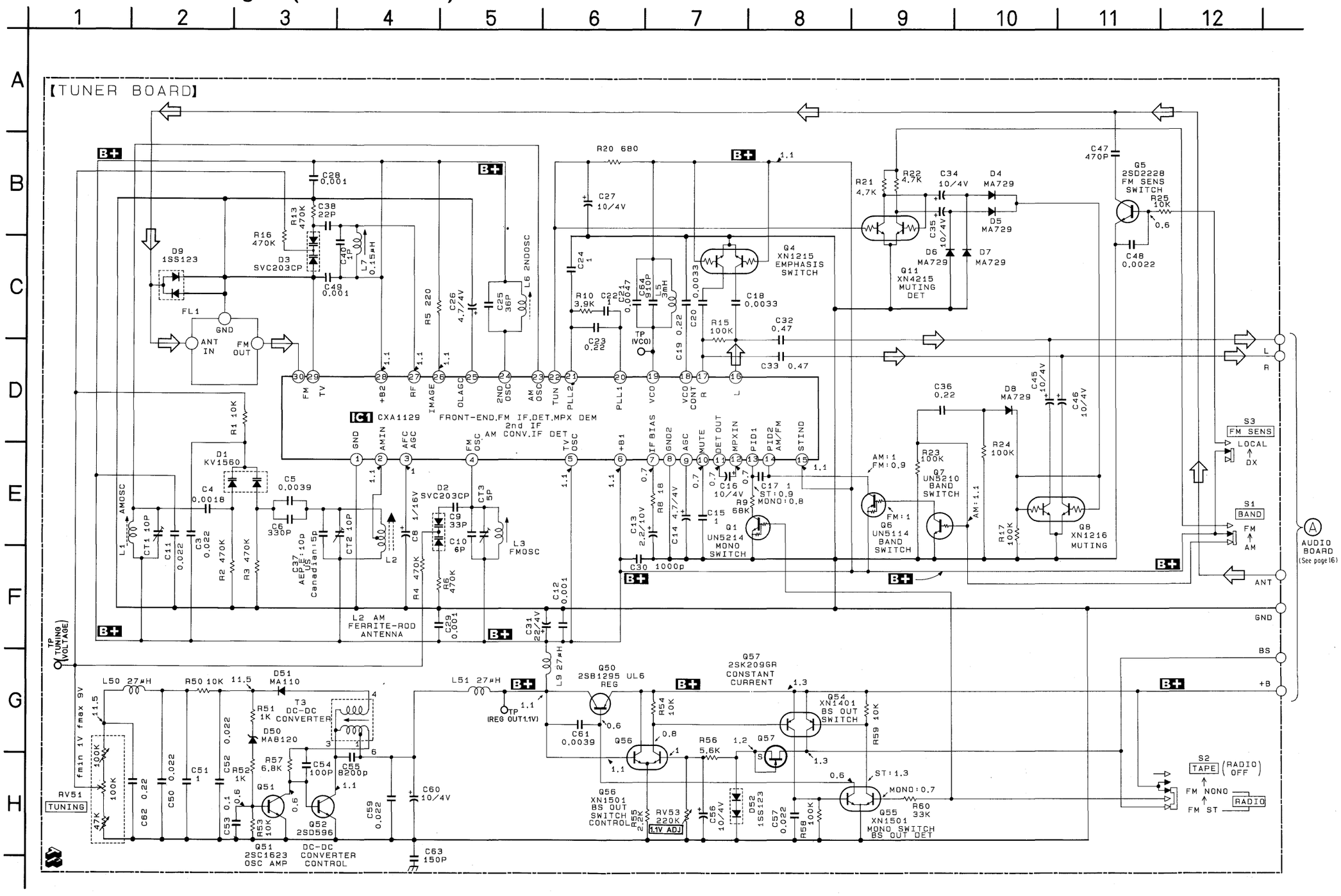
- Signal path

⇨ : FM ⇨ : PB (playback)

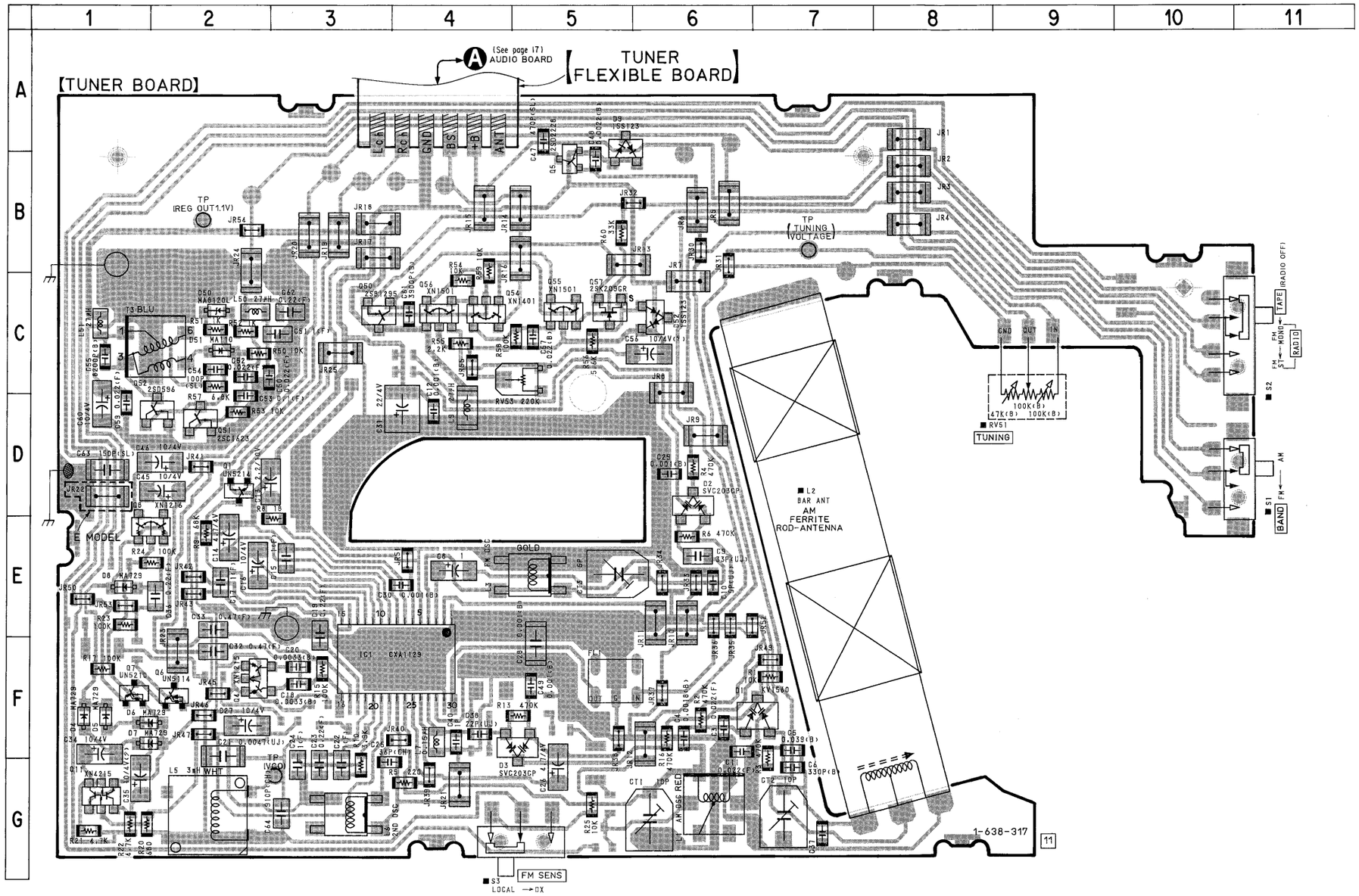
SCHEMATICS AND BOARD DIAGRAMS

Tuner Board Schematic Diagram (WM-FX50 ONLY)

• Refer to page 14 for Schematic Diagram note.



Tuner Board Printed Wiring Boards

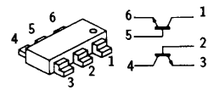


Semiconductor Location

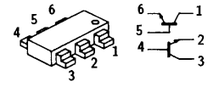
Ref. No.	Location
D1	F-6
D2	D-6
D3	G-4
D4	F-1
D5	F-1
D6	F-1
D7	F-1
D8	E-1
D9	A-5
D50	C-2
D51	C-2
D52	C-6
IC1	F-3
Q1	D-2
Q4	F-2
Q5	B-5
Q6	F-2
Q7	F-1
Q8	D-1
Q11	G-1
Q50	C-3
Q51	D-2
Q52	D-2
Q54	C-4
Q55	C-5
Q56	C-4
Q57	C-5

Semiconduct r layouts

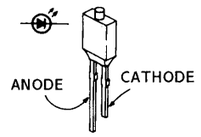
XN4215



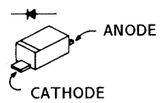
XN5501



GL2PR90



MA8120
MA110
MA729



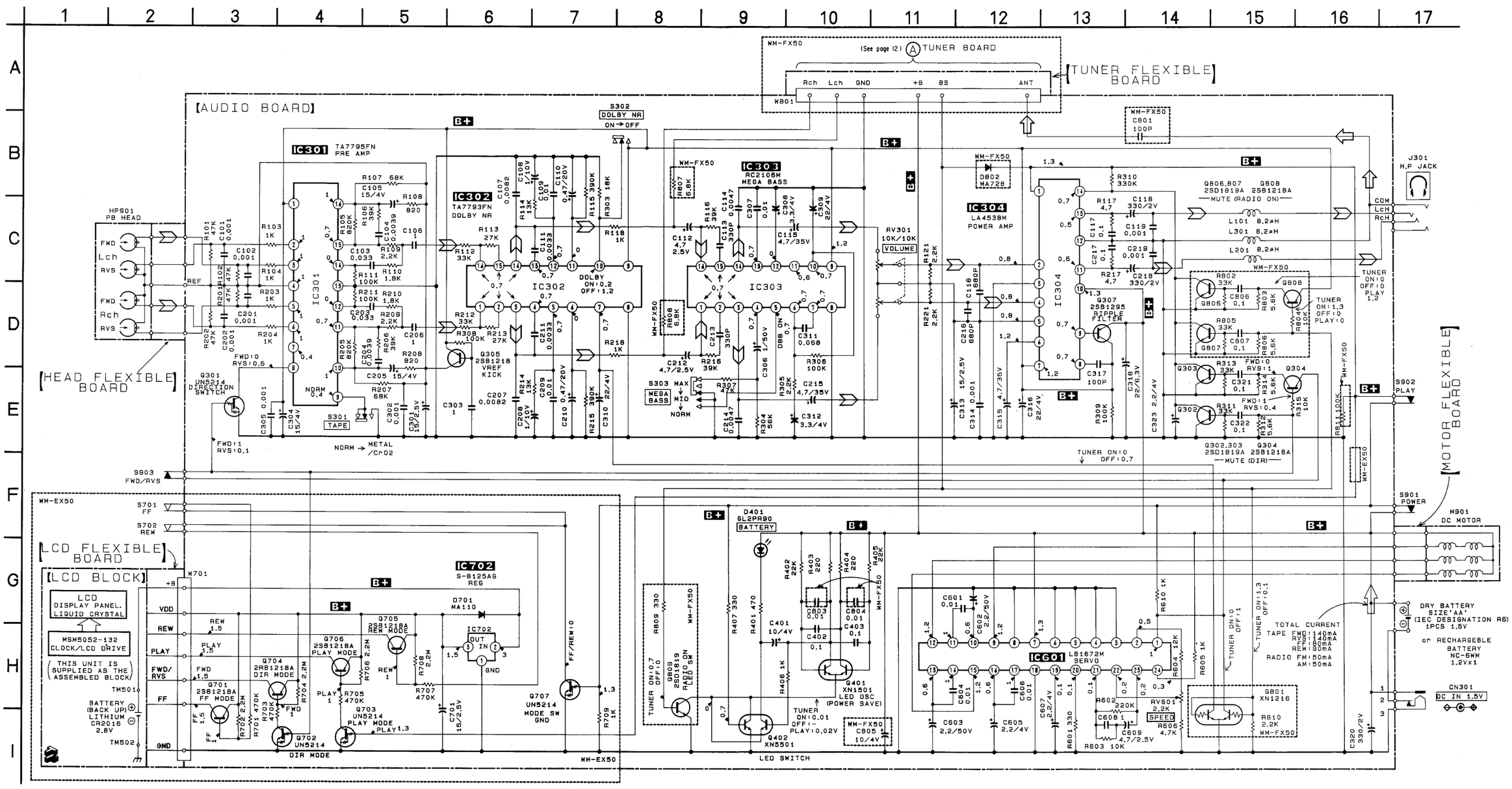
Note on Printed Wiring Boards :

- ■ : parts mounted on the conductor side.
- ▒ : Pattern on the side which is seen.

Note on Schematic Diagram :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- **B+** : B+ Line
- ▭ : adjustment for repair.
- Power voltage is dc 1.3V and fed with regulated dc power supply from external power voltage jack.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM

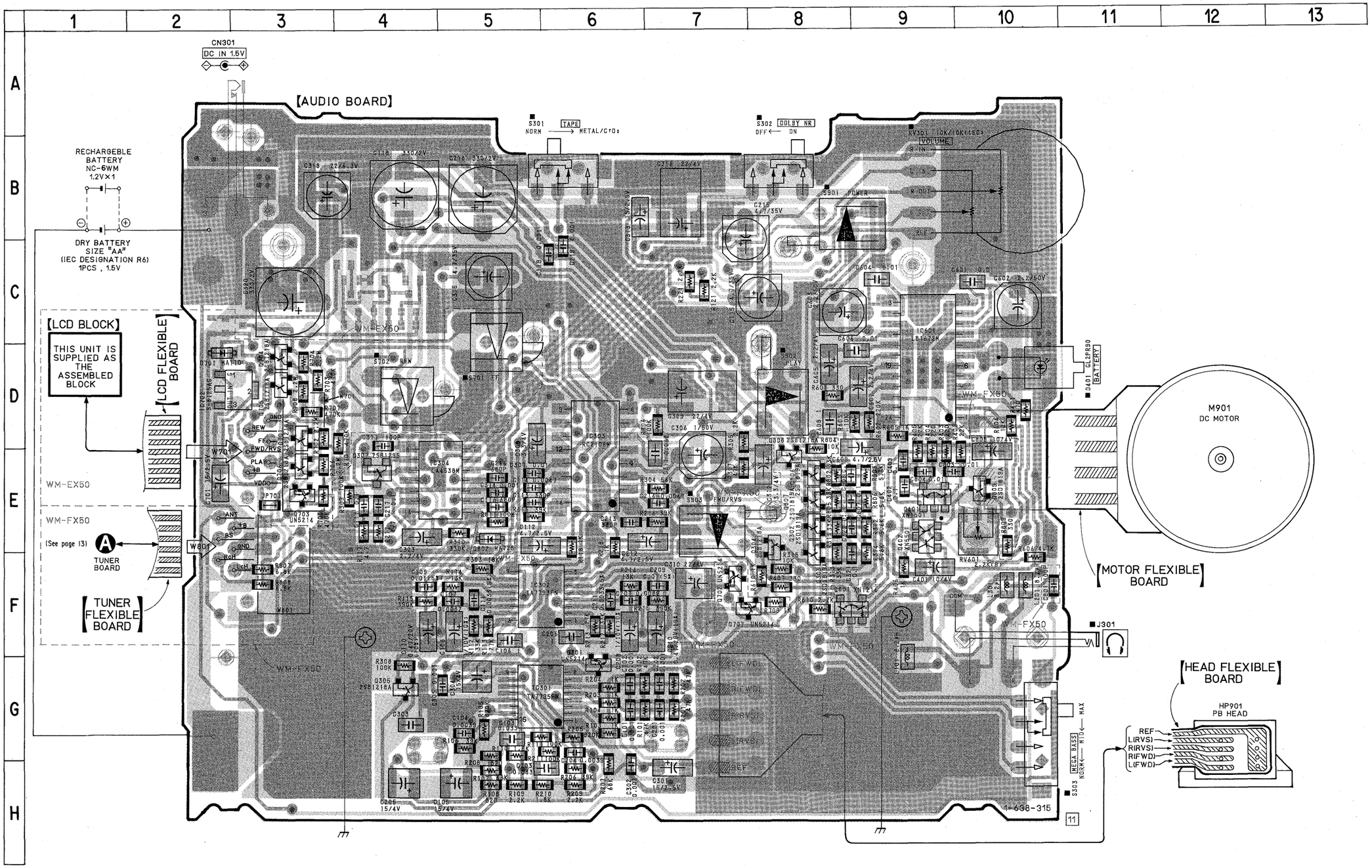
Audio Board Schematic Diagram



Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- B+ : B+ Line
- ▭ : adjustment for repair.
- Total current is measured with no cassette installed.
- Power voltage is dc 1.3V and fed with regulated dc power supply from external power voltage jack.
- Voltage and waveforms are dc with respect to ground under no-signal (In playback mode) conditions.
  no mark : FWD
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM ⇨ : PB

Audio Board Printed Wiring Boards



Note :

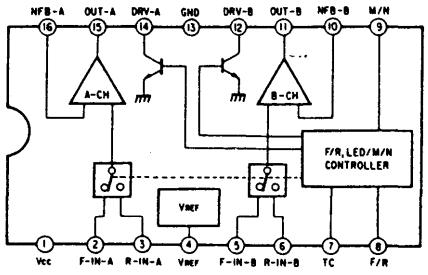
- ■ : parts mounted on the conductor side.
- ◎ : Through hole.
- ▒ : Pattern on the side which is seen.
- ▒ : Pattern of the rear side.

Semic nduct r Locati n

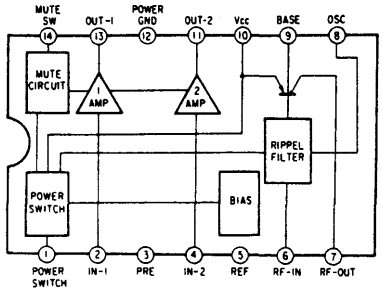
Ref. No.	Location
D401	D10
D701	D-2
D802	E-5
IC301	G-5
IC302	F-5
IC303	D-6
IC304	E-5
IC601	C-9
IC702	D-2
Q301	G-6
Q302	E-8
Q303	F-8
Q304	E-8
Q305	G-4
Q307	E-4
Q401	E-9
Q402	E-9
Q701	D-3
Q702	F-7
Q703	E-3
Q704	D-3
Q705	D-3
Q706	E-3
Q707	F-7
Q801	F-8
Q806	E-8
Q807	E-8
Q808	E-8
Q809	E-10

IC layouts

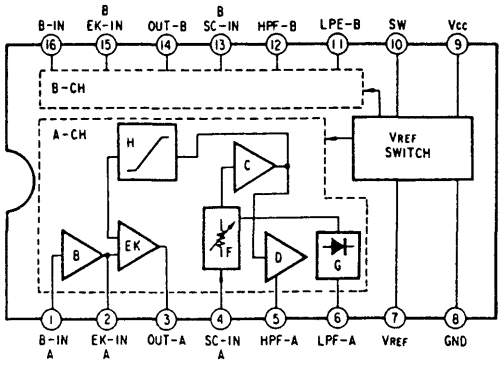
IC301 TA7795F



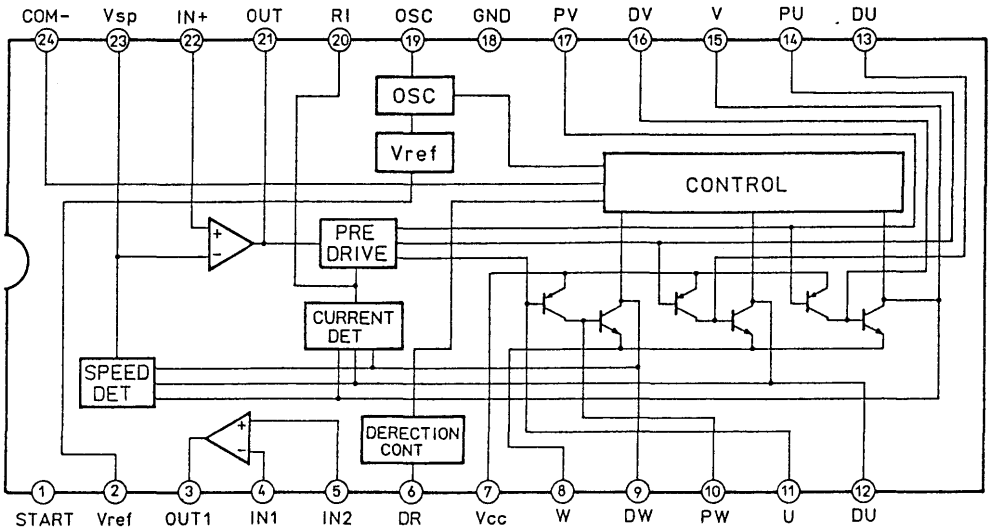
IC304 LA4538M



IC302 TA7793F



IC601 LB1672M



SPARE PARTS LIST

Exploded Views and Mechanical Parts

NOTE:

—XX, —X mean standardized parts, so they may have some differences from the original one.

The construction parts of an assembled part are indicated with a collation number in the remark column.

Color indication of Appearance Parts

Example:

KNOB, BALANCE (WHITE)....(RED)

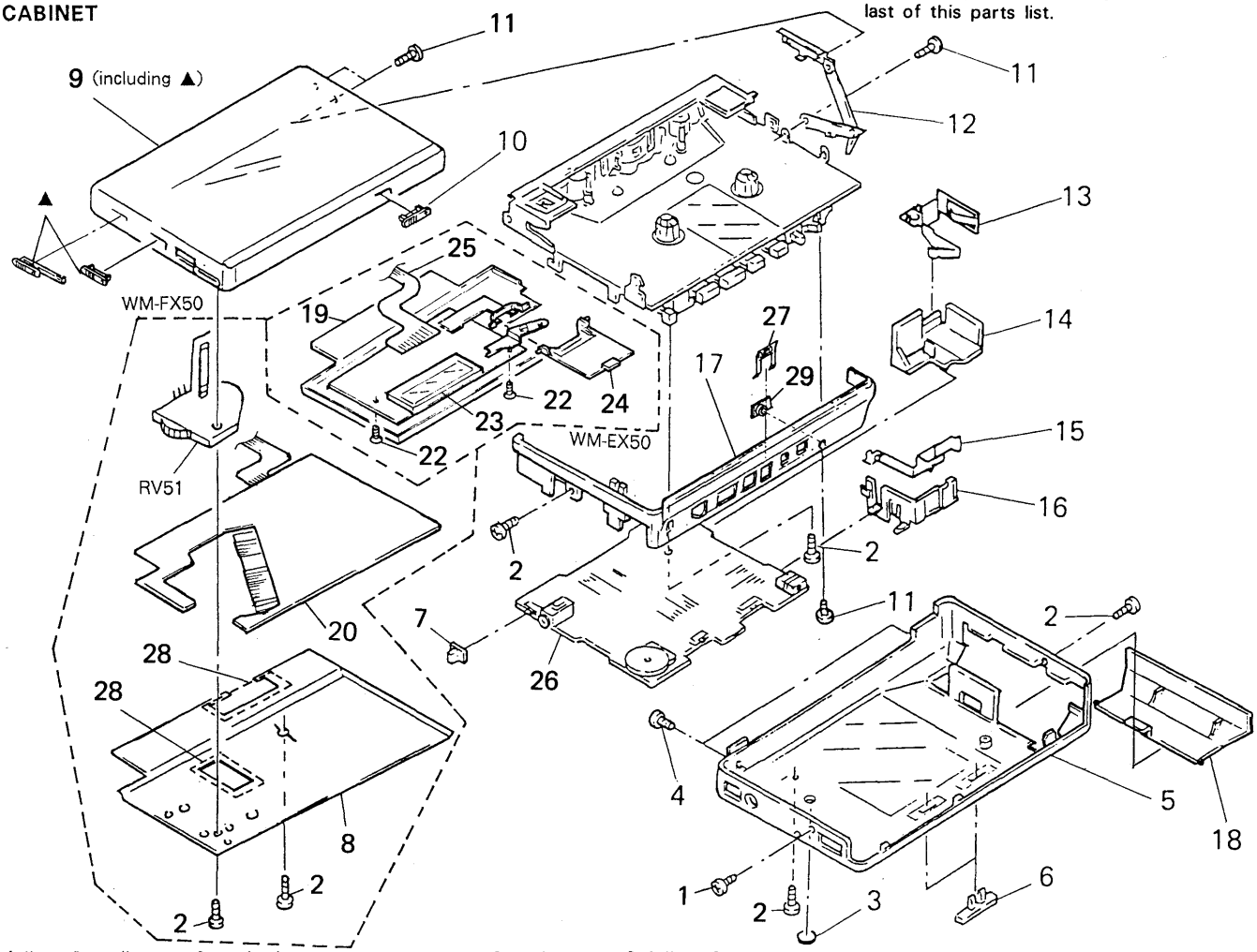
↑ ↑

Parts color Cabinet's color

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items. The mechanical parts with no reference number in the exploded views are not supplied.

- Hardware (#mark) list is given in the last of this parts list.

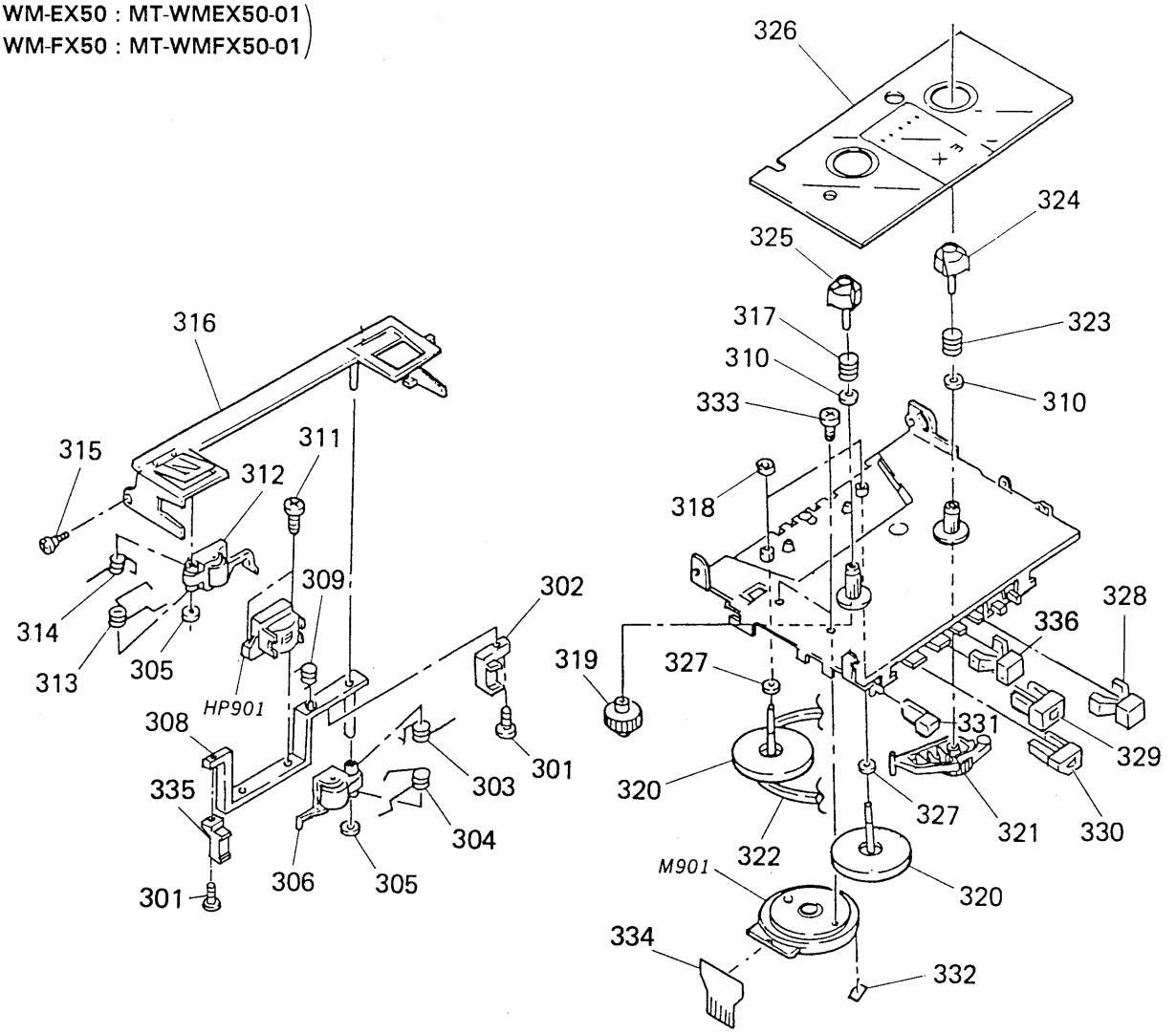
CABINET



Ref. No.	Part No.	Description	Remark
1	3-704-197-61	SCREW (M1.4X4.0), LOCKING	
2	3-704-197-11	SCREW (M1.4X2.0), LOCKING	
3	3-342-380-01	SHEET, SPEED HOLE (BLACK)	
3	3-368-118-01	SHEET, SPEED HOLE (GRAY)	
4	3-704-197-31	SCREW (M1.4X3.0), LOCKING	
5	X-3362-867-1	CABINET (REAR) ASSY (BLACK) (FX50:AEP, E)	
5	X-3362-872-1	CABINET (REAR) ASSY (BLACK) (EX50:AEP, E)	
5	X-3362-875-1	CABINET (REAR) ASSY (GRAY) (EX50)	
5	X-3362-870-1	CABINET (REAR) ASSY (GRAY) (FX50:US, Canadian, E)	
6	3-352-045-01	KNOB (TAPE)	
7	3-348-186-01	KNOB (DBB)	
8	3-367-795-01	COVER (FX50)	
9	X-3362-868-1	LID ASSY, CASSETTE (BLACK) (FX50:AEP, E)	
9	X-3362-873-1	LID ASSY, CASSETTE (BLACK) (EX50:AEP, E)	
9	X-3362-874-1	LID ASSY, CASSETTE (GRAY) (EX50)	
9	X-3362-871-1	LID ASSY, CASSETTE (GRAY) (FX50:E)	
9	X-3363-078-1	LID ASSY, CASSETTE (GRAY) (FX50:US, Canadian)	
10	3-367-791-01	KNOB (LOCAL/DX)	
11	3-704-197-01	SCREW (M1.4X1.6), LOCKING	
12	X-3352-013-1	ARM ASSY, CLICK	
13	3-357-914-01	TERMINAL BOARD, MINUS	
14	3-352-050-01	HOLDER (B), TERMINAL	
15	3-352-047-01	TERMINAL BOARD, PLUS	
16	3-352-049-01	HOLDER (A), TERMINAL	
17	3-367-812-01	ORNAMENTAL, REEL	
18	3-367-803-01	LID, BATTERY CASE (GRAY)	
18	3-367-803-11	LID, BATTERY CASE (BLACK)	
19	3-367-801-01	PLATE, BLIND (EX50)	
20	A-3016-050-A	TUNER BOARD, COMPLETE (FX50:AEP, E)	
20	A-3016-055-A	TUNER BOARD, COMPLETE (FX50:US, Canadian)	
21	1-638-316-11	FLEXIBLE BOARD, TUNER (FX50)	
22	3-318-382-61	SCREW (1.7X2.5), TAPPING (EX50)	
23	1-809-282-11	DISPLAY PANEL BLOCK, LIQUID CRYSTAL (EX50)	
24	3-367-802-01	LID (LITHIUM), BATTERY CASE (EX50)	
25	1-638-314-11	PC BOARD, LCD FLEXIBLE (EX50)	
26	A-3016-049-A	AUDIO BOARD, COMPLETE (FX50)	
26	A-3016-051-A	AUDIO BOARD, COMPLETE (EX50)	
27	3-367-804-01	SPRING, CASSETTE RETAINER	
28	3-347-289-01	SHEET (COVER) (FX50)	
29	* 3-368-117-01	SPACER	

TAPE TRANSPORT (1)

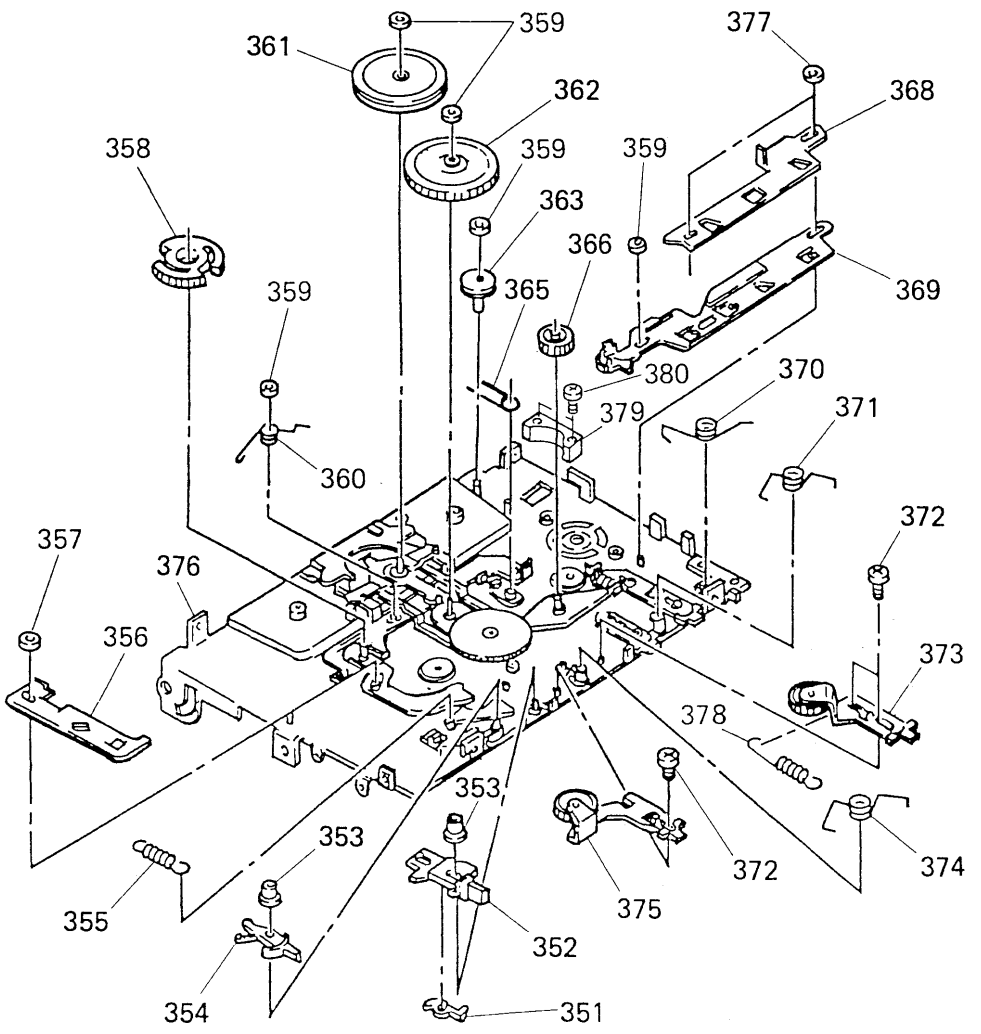
(WM-EX50 : MT-WMEX50-01
WM-FX50 : MT-WMFX50-01)



Ref. No.	Part No.	Description	Remark
301	3-348-998-31	SCREW (M1.4X2.5), TAPPING, PAN	
302	3-344-693-01	GUIDE (LEFT)	
303	3-341-468-01	SPRING (R)	
304	3-354-420-01	SPRING (PINCH RK), TORSION	
305	3-341-473-01	WASHER (MP)	
306	X-3331-035-1	PINCH LEVER (R) ASSY	
308	3-345-725-01	LEVER (AZ), HEAD	
309	3-347-205-01	SPRING (HD LEVER), TORSION	
310	3-365-356-01	WASHER	
311	3-348-998-71	SCREW (M1.4X4.5), TAPPING, PAN	
312	X-3331-036-1	PINCH LEVER (N) ASSY	
313	3-354-421-01	SPRING (PINCH NK), TORSION	
314	3-341-469-01	SPRING (N)	
315	3-352-005-01	SCREW(M1.4X1.6),PRECISION STEP	
316	X-3352-009-1	HOLDER (X) ASSY (EX50)	
316	X-3362-810-1	HOLDER (S.T) ASSY (FX50)	
317	3-348-989-01	SPRING, COMPRESSION	
318	3-352-098-01	WASHER, STOPPER	
319	3-348-151-01	GEAR (TAKE-UP REEL)	
320	X-3352-007-1	WHEEL (X) ASSY, CAPSTAN	

Ref. No.	Part No.	Description	Remark
321	X-3348-110-1	LEVER ASSY, PICK UP	
322	3-349-814-01	BELT	
323	3-354-494-01	SPRING (S REEL), COMPRESSION	
324	3-348-149-01	REEL, SUPPLY	
325	3-348-150-01	REEL, TAKE-UP	
326	3-352-010-01	COVER (X), MD	
326	3-354-467-01	COVER, MD	
327	3-354-407-01	WASHER	
328	3-367-362-01	BUTTON (REW)	
329	3-367-363-01	BUTTON (STOP)	
330	3-367-361-01	BUTTON (FWD)	
331	3-367-359-01	BUTTON (OPEN)	
333	3-354-448-01	SCREW (TOOTH)	
334	1-638-313-11	PC BOARD, MOTOR FLEXIBLE	
335	3-344-694-01	GUIDE (RIGHT)	
336	3-367-360-01	BUTTON (FF)	
HP901	1-543-812-11	HEAD, MAGNETIC (PLAYBACK)	
M901	1-541-660-11	MOTOR	

TAPE TRANSPORT (2)



Ref. No.	Part No.	Description	Remark
351	3-348-101-01	RATCHET	
352	3-348-156-01	LEVER, DIR (MADE IN JAPAN)	
352	3-364-971-01	LEVER, DIR (MADE IN CHINISE)	
353	3-348-102-01	BUSHING	
354	3-348-105-01	LEVER, MODE SELECTION	
355	3-348-163-01	SPRING, TENSION	
356	3-352-002-02	LEVER (X), TRIGGER	
357	3-348-953-11	WASHER	
358	3-352-032-01	GEAR (X), CAM	
359	3-348-996-01	WASHER	
360	3-348-172-03	SPRING (S.OFF), TORSION	
361	3-352-007-01	PULLEY (MIDWAY.X)	
362	X-3352-027-3	CLUTCH (X) ASSY	
363	3-354-470-01	PULLEY (REVERSE X.T)	
365	3-348-159-01	SPRING (NR), TORSION	
366	3-352-021-01	GEAR (N.X)	

Ref. No.	Part No.	Description	Remark
368	3-352-028-01	LEVER (X), SW	
369	X-3348-102-1	LEVER ASSY, LOCK (MADE IN JAPAN)	
369	X-3362-240-1	LEVER ASSY, LOCK (MADE IN CHINISE)	
370	3-348-162-01	SPRING (LOCK), TORSION	
371	3-348-103-01	SPRING (PLAY), TORSION	
372	3-348-160-01	SCREW (M1.4X1.3), PRECISION PAN	
373	X-3362-812-1	LEVER (X) ASSY, FF	
374	3-348-168-01	SPRING (FR), TORSION (MADE IN JAPAN)	
374	3-395-577-01	SPRING (FR), TORSION (MADE IN CHINISE)	
375	X-3362-811-1	LEVER (X) ASSY, REW	
376	X-3363-113-1	CHASSIS (X) COMP ASSY	
377	3-357-927-01	WASHER	
378	3-352-026-01	SPRING, TENSION	
379	3-357-918-01	GUIDE (BELT)	
380	3-704-252-41	SCREW (M1.4X6)	

Electrical Parts

AUDIO

NOTE:

Due to standardization, replacements in th parts list may be different from the parts specified in the diagrams or the components used on the set.

- −XX, −X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA....: μA...., uPA....: μPA....
  uPB....: μPB...., uPC....: μPC....
  uPD....: μPD....
- CAPACITORS
  uF: μF
- COILS
  uH: μH

Ref. No.	Part No.	Description			Remark
	A-3016-049-A	AUDIO BOARD, COMPLETE (FX50)			
	A-3016-051-A	AUDIO BOARD, COMPLETE (EX50)			
		**********			
	3-352-047-01	TERMINAL BOARD, PLUS			
	3-352-049-01	HOLDER (A), TERMINAL			
	3-352-050-01	HOLDER (B), TERMINAL			
	3-357-914-01	TERMINAL BOARD, MINUS			
		< CAPACITOR >			
C101	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C103	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C104	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C105	1-135-158-21	TANTALUM CHIP	15uF	20%	4V
C106	1-164-346-11	CERAMIC CHIP	1uF		16V
C107	1-164-174-11	CERAMIC CHIP	0.0082uF	10%	25V
C108	1-135-208-11	TANTAL. CHIP	1uF	10%	10V
C109	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C110	1-135-192-21	TANTAL. CHIP	0.47uF	10%	20V
C111	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C112	1-135-218-11	TANTAL. CHIP	4.7uF	20%	2.5V
C113	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C114	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C115	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C116	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C117	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C118	1-126-608-11	ELECT	330uF	20%	2V
C119	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C201	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C202	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C203	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C204	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C205	1-135-158-21	TANTALUM CHIP	15uF	20%	4V
C206	1-164-346-11	CERAMIC CHIP	1uF		16V
C207	1-164-174-11	CERAMIC CHIP	0.0082uF	10%	25V
C208	1-135-208-11	TANTAL. CHIP	1uF	10%	10V
C209	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C210	1-135-192-21	TANTAL. CHIP	0.47uF	10%	20V
C211	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C212	1-135-218-11	TANTAL. CHIP	4.7uF	20%	2.5V
C213	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C214	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C215	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C216	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C217	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C218	1-126-608-11	ELECT	330uF	20%	2V
C219	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C301	1-135-219-11	TANTAL. CHIP	15uF	20%	2.5V
C302	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C303	1-164-346-11	CERAMIC CHIP	1uF		16V
C304	1-135-158-21	TANTALUM CHIP	15uF	20%	4V
C305	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C306	1-126-193-11	ELECT	1uF	20%	50V
C307	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C308	1-135-221-11	TANTAL. CHIP	3.3uF	20%	4V
C309	1-126-590-11	ELECT CHIP	22uF	20%	4V
C310	1-135-202-21	TANTAL. CHIP	22uF	20%	4V
C311	1-163-833-00	CERAMIC CHIP	0.068uF		25V
C312	1-135-221-11	TANTAL. CHIP	3.3uF	20%	4V
C313	1-135-219-11	TANTAL. CHIP	15uF	20%	2.5V
C314	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C315	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C316	1-126-590-11	ELECT CHIP	22uF	20%	4V
C317	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C318	1-126-605-11	ELECT	22uF	20%	6.3V
C320	1-126-608-11	ELECT	330uF	20%	2V
C321	1-164-156-11	CERAMIC CHIP	0.1uF		25V

AUDIO

Ref. No.	Part No.	Description			Remark
C322	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C323	1-135-187-21	TANTAL. CHIP	2.2uF	20% 4V	
C401	1-135-201-11	TANTALUM CHIP	10uF	20% 4V	
C402	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C403	1-164-156-11	CERAMIC CHIP	0.1uF	25V	
C601	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C602	1-126-601-11	ELECT	2.2uF	20% 50V	
C603	1-126-601-11	ELECT	2.2uF	20% 50V	
C604	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C605	1-135-187-21	TANTAL. CHIP	2.2uF	20% 4V	
C606	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C607	1-135-187-21	TANTAL. CHIP	2.2uF	20% 4V	
C608	1-164-346-11	CERAMIC CHIP	1uF	16V	
C609	1-135-218-11	TANTAL. CHIP	4.7uF	20% 2.5V	
C701	1-135-219-11	TANTAL. CHIP	15uF	20% 2.5V	(EX50)
C801	1-162-953-11	CERAMIC CHIP	100PF	5% 50V	(FX50)
C803	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	(FX50)
C804	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	(FX50)
C805	1-135-201-11	TANTALUM CHIP	10uF	20% 4V	(FX50)
C806	1-164-156-11	CERAMIC CHIP	0.1uF	25V	(FX50)
C807	1-164-156-11	CERAMIC CHIP	0.1uF	25V	(FX50)
		< CONNECTOR >			
CN301	1-580-919-11	JACK, DC (POLARITY UNIFIED TYPE)		(DC IN 1.5V)	
		< DIODE >			
D401	8-719-976-16	DIODE	GL2PR90 (BATTERY)		
D701	8-719-404-46	DIODE	MA110 (EX50)		
D802	8-719-421-27	DIODE	MA728 (FX50)		
		< IC >			
IC301	8-759-230-91	IC	TA7795FN		
IC302	8-759-230-88	IC	TA7793FN		
IC303	8-759-512-77	IC	RC2106M		
IC304	8-759-805-02	IC	LA4538M		
IC601	8-759-821-20	IC	LB1672M		
IC702	8-759-515-82	IC	S-8125AG-RK-S (EX50)		
		< JACK >			
J301	1-568-467-11	JACK (PHONES)			
		< RESISTOR >			
JR701	1-216-864-11	METAL GLAZE	0	5% 1/16W	(EX50)

Ref. No.	Part No.	Description			Remark
		< COIL >			
L101	1-412-005-11	INDUCTOR CHIP	8.2uH		
L201	1-412-005-11	INDUCTOR CHIP	8.2uH		
L301	1-412-005-11	INDUCTOR CHIP	8.2uH		
		< TRANSISTOR >			
Q301	8-729-421-26	TRANSISTOR	UN5216QRS		
Q302	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q303	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q304	8-729-402-55	TRANSISTOR	2SB1218A-R		
Q305	8-729-402-55	TRANSISTOR	2SB1218A-R		
Q307	8-729-807-87	TRANSISTOR	2SB1295-UL6		
Q401	8-729-421-23	TRANSISTOR	XN1216		
Q402	8-729-402-75	TRANSISTOR	XN5501		
Q701	8-729-402-55	TRANSISTOR	2SB1218A-R		(EX50)
Q702	8-729-421-26	TRANSISTOR	UN5216QRS		(EX50)
Q703	8-729-421-26	TRANSISTOR	UN5216QRS		(EX50)
Q704	8-729-402-55	TRANSISTOR	2SB1218A-R		(EX50)
Q705	8-729-402-55	TRANSISTOR	2SB1218A-R		(EX50)
Q706	8-729-402-55	TRANSISTOR	2SB1218A-R		(EX50)
Q707	8-729-421-26	TRANSISTOR	UN5216QRS		(EX50)
Q801	8-729-421-23	TRANSISTOR	XN1216		(FX50)
Q806	8-729-402-32	TRANSISTOR	2SD1819A-R		(FX50)
Q807	8-729-402-32	TRANSISTOR	2SD1819A-R		(FX50)
Q808	8-729-402-55	TRANSISTOR	2SB1218A-R		(FX50)
Q809	8-729-402-32	TRANSISTOR	2SD1819A-R		(FX50)
		< RESISTOR >			
R101	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R102	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R103	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R104	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R105	1-216-856-11	METAL CHIP	820K	5% 1/16W	
R106	1-216-840-11	METAL CHIP	39K	5% 1/16W	
R107	1-216-843-11	METAL CHIP	68K	5% 1/16W	
R108	1-216-820-11	METAL CHIP	820	5% 1/16W	
R109	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	
R110	1-216-824-11	METAL CHIP	1.8K	5% 1/16W	
R111	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R112	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R113	1-216-838-11	METAL CHIP	27K	5% 1/16W	
R114	1-216-994-11	METAL GLAZE	13K	5% 1/16W	
R115	1-216-852-11	METAL CHIP	390K	5% 1/16W	
R116	1-216-840-11	METAL CHIP	39K	5% 1/16W	
R117	1-216-793-11	METAL GLAZE	4.7	5% 1/16W	
R118	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R121	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	
R201	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R202	1-216-841-11	METAL CHIP	47K	5% 1/16W	

Ref. No.	Part No.	Description			Remark
R203	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R204	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R205	1-216-856-11	METAL CHIP	820K	5% 1/16W	
R206	1-216-840-11	METAL CHIP	39K	5% 1/16W	
R207	1-216-843-11	METAL CHIP	68K	5% 1/16W	
R208	1-216-820-11	METAL CHIP	820	5% 1/16W	
R209	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	
R210	1-216-824-11	METAL CHIP	1.8K	5% 1/16W	
R211	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R212	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R213	1-216-838-11	METAL CHIP	27K	5% 1/16W	
R214	1-216-994-11	METAL GLAZE	13K	5% 1/16W	
R215	1-216-852-11	METAL CHIP	390K	5% 1/16W	
R216	1-216-840-11	METAL CHIP	39K	5% 1/16W	
R217	1-216-793-11	METAL GLAZE	4.7	5% 1/16W	
R218	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R221	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	
R303	1-216-836-11	METAL CHIP	18K	5% 1/16W	
R304	1-216-842-11	METAL CHIP	56K	5% 1/16W	
R305	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	
R306	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R307	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R308	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R309	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R310	1-216-851-11	METAL CHIP	330K	5% 1/16W	
R311	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R312	1-216-830-11	METAL CHIP	5.6K	5% 1/16W	
R313	1-216-839-11	METAL CHIP	33K	5% 1/16W	
R314	1-216-830-11	METAL CHIP	5.6K	5% 1/16W	
R315	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R401	1-216-817-11	METAL CHIP	470	5% 1/16W	
R402	1-216-837-11	METAL CHIP	22K	5% 1/16W	
R403	1-216-813-11	METAL CHIP	220	5% 1/16W	
R404	1-216-813-11	METAL CHIP	220	5% 1/16W	
R405	1-216-837-11	METAL CHIP	22K	5% 1/16W	
R406	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R407	1-216-815-11	METAL CHIP	330	5% 1/16W	
R601	1-216-815-11	METAL CHIP	330	5% 1/16W	
R602	1-216-849-11	METAL CHIP	220K	5% 1/16W	
R603	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R604	1-216-834-11	METAL CHIP	12K	5% 1/16W	
R605	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R606	1-216-829-11	METAL CHIP	4.7K	5% 1/16W	
R610	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R701	1-216-853-11	METAL GLAZE	470K	5% 1/16W	(EX50)
R702	1-216-861-11	METAL GLAZE	2.2M	5% 1/16W	(EX50)
R703	1-216-853-11	METAL GLAZE	470K	5% 1/16W	(EX50)
R704	1-216-861-11	METAL GLAZE	2.2M	5% 1/16W	(EX50)
R705	1-216-853-11	METAL GLAZE	470K	5% 1/16W	(EX50)
R706	1-216-861-11	METAL GLAZE	2.2M	5% 1/16W	(EX50)
R707	1-216-853-11	METAL GLAZE	470K	5% 1/16W	(EX50)
R708	1-216-861-11	METAL GLAZE	2.2M	5% 1/16W	(EX50)
R709	1-216-821-11	METAL GLAZE	1K	5% 1/16W	(EX50)
R802	1-216-839-11	METAL CHIP	33K	5% 1/16W	(FX50)
R803	1-216-830-11	METAL CHIP	5.6K	5% 1/16W	(FX50)
R804	1-216-833-11	METAL CHIP	10K	5% 1/16W	(FX50)
R805	1-216-839-11	METAL CHIP	33K	5% 1/16W	(FX50)
R806	1-216-830-11	METAL CHIP	5.6K	5% 1/16W	(FX50)
R807	1-216-831-11	METAL CHIP	6.8K	5% 1/16W	(FX50)
R808	1-216-831-11	METAL CHIP	6.8K	5% 1/16W	(FX50)
R809	1-216-815-11	METAL CHIP	330	5% 1/16W	(FX50)
R810	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	(FX50)
R811	1-216-845-11	METAL CHIP	100K	5% 1/16W	(FX50)

< VARIABLE RESISTOR >

RV301	1-241-526-11	RES, VAR, CARBON 10K/10K (VOLUME)
RV601	1-237-002-11	RES, ADJ, METAL GLAZE 2.2K (SPEED)

< SWITCH >

S301	1-571-275-11	SWITCH, SLIDE (TAPE)
S302	1-571-275-31	SWITCH, SLIDE (DOLBY NR)
S303	1-571-506-11	SWITCH, SLIDE (MEGA BASS)
S701	1-572-288-11	SWITCH, PUSH (FF) (EX50)
S702	1-572-288-11	SWITCH, PUSH (REW) (EX50)
S901	1-571-585-11	SWITCH, PUSH (1 KEY) (POWER)
S902	1-571-585-11	SWITCH, PUSH (1 KEY) (PLAY)
S903	1-571-585-11	SWITCH, PUSH (1 KEY) (FWD/RVS)

< SOCKET >

W701	1-580-482-11	SOCKET, CONNECTOR 7P (EX50)
W801	1-568-253-21	HOUSING, CONNECTOR 7P (FX50)

****

TUNER FLEXIBLE

Ref. No.	Part No.	Description			Remark
	--- WM-FX50 ONLY ---				
	A-3016-050-A	TUNER BOARD, COMPLETE (AEP, E)			
	A-3016-055-A	TUNER BOARD, COMPLETE (US, Canadian)			
		**********			
	1-638-316-11	FLEXIBLE BOARD			
		**********			
		< CAPACITOR >			
C3	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C4	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C5	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C6	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C8	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C9	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C10	1-164-433-11	CERAMIC CHIP	6PF	0.5PF	50V
C11	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C12	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C13	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C14	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C15	1-164-346-11	CERAMIC CHIP	1uF		16V
C16	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C17	1-164-346-11	CERAMIC CHIP	1uF		16V
C18	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C19	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C20	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C21	1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V
C22	1-164-346-11	CERAMIC CHIP	1uF		16V
C23	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C24	1-164-346-11	CERAMIC CHIP	1uF		16V
C25	1-164-238-11	CERAMIC CHIP	36PF	10%	50V
C26	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C27	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C28	1-163-205-00	CERAMIC CHIP	0.001uF	5%	50V
C29	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C30	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C31	1-135-202-21	TANTAL. CHIP	22uF	20%	4V
C32	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C33	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C34	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C35	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C36	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C37	1-162-997-11	CERAMIC CHIP	10PF	50V	(AEP, E)
C37	1-162-936-11	CERAMIC CHIP	5PF	50V	(US, Canadian)
C38	1-162-998-11	CERAMIC CHIP	22PF	5%	50V
C40	1-164-428-91	CERAMIC CHIP	1PF	0.25PF	50V
C45	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C46	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C47	1-164-362-11	CERAMIC CHIP	470PF		50V
C48	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C49	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C50	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C51	1-164-346-11	CERAMIC CHIP	1uF		16V
C52	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C53	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C54	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C55	1-164-174-11	CERAMIC CHIP	0.0082uF	10%	25V
C56	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C57	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C59	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C60	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C61	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C62	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C63	1-163-185-00	CERAMIC CHIP	150PF	5%	50V
C64	1-163-140-00	CERAMIC CHIP	910PF	5%	50V
		< TRIMMER >			
CT1	1-141-327-11	CAP, VAR, TRIMMER	(CHIP TYPE) (AM FREQ. COVER)		
CT2	1-141-327-11	CAP, VAR, TRIMMER	(CHIP TYPE) (AM TRACKING)		
CT3	1-141-325-11	CAP, VAR, TRIMMER	(CHIP TYPE) (FM FREQ. COVER)		
		< DIODE >			
D1	8-719-951-05	DIODE	KV1560		
D2	8-719-939-02	DIODE	SVC203CP		
D3	8-719-939-02	DIODE	SVC203CP		
D4	8-719-420-51	DIODE	MA729		
D5	8-719-420-51	DIODE	MA729		
D6	8-719-420-51	DIODE	MA729		
D7	8-719-420-51	DIODE	MA729		
D8	8-719-420-51	DIODE	MA729		
D9	8-719-800-76	DIODE	1SS226		
D50	8-719-421-21	DIODE	MA8120-L		
D51	8-719-404-46	DIODE	MA110		
D52	8-719-800-76	DIODE	1SS226		
		< FILTER >			
FL1	1-239-015-21	FILTER, BAND PASS			
		< IC >			
IC1	8-752-050-43	IC	CXA1129N		

FLEXIBLE DISPLAY PANEL BLOCK

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
JR1-JR25	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR30-JR55	1-216-864-11	METAL CHIP	0		
		< COIL >			
L1	1-412-764-21	COIL (AM OSC)			
L2	1-402-551-11	ANTENNA, FERRITE-ROD (LW)			
L3	1-412-765-21	COIL (FM OSC)			
L5	1-412-763-21	COIL (VCO)			
L6	1-412-762-21	COIL (2ND OSC)			
L7	1-410-983-31	INDUCTOR CHIP	0.15uH		
L9	1-410-209-51	INDUCTOR CHIP	27uH		
L50	1-412-011-31	INDUCTOR CHIP	27uH		
L51	1-412-011-31	INDUCTOR CHIP	27uH		
		< TRANSISTOR >			
Q1	8-729-421-26	TRANSISTOR	UN5214		
Q4	8-729-403-17	TRANSISTOR	XN1215		
Q5	8-729-144-16	TRANSISTOR	2SD2228-T1D44D45		
Q6	8-729-402-96	TRANSISTOR	UN5114		
Q7	8-729-421-74	TRANSISTOR	UN5210-Q		
Q8	8-729-421-23	TRANSISTOR	XN1216		
Q11	8-729-422-54	TRANSISTOR	XN4215-TW		
Q50	8-729-807-87	TRANSISTOR	2SB1295-UL6		
Q51	8-729-100-66	TRANSISTOR	2SC1623-L6		
Q52	8-729-159-64	TRANSISTOR	2SD596-VD4		
Q54	8-729-403-42	TRANSISTOR	XN1401		
Q55	8-729-421-23	TRANSISTOR	XN1216		
Q56	8-729-421-23	TRANSISTOR	XN1216		
Q57	8-729-220-93	TRANSISTOR	2SK209-G		
		< RESISTOR >			
R1	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R2	1-216-853-11	METAL CHIP	470K	5% 1/16W	
R3	1-216-853-11	METAL CHIP	470K	5% 1/16W	
R4	1-216-853-11	METAL CHIP	470K	5% 1/16W	
R5	1-216-813-11	METAL CHIP	220	5% 1/16W	
R6	1-216-853-11	METAL CHIP	470K	5% 1/16W	
R8	1-216-800-11	METAL GLAZE	18	5% 1/16W	
R9	1-216-843-11	METAL CHIP	68K	5% 1/16W	
R10	1-216-828-11	METAL CHIP	3.9K	5% 1/16W	
R13	1-216-853-11	METAL CHIP	470K	5% 1/16W	
R15	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R16	1-216-853-11	METAL CHIP	470K	5% 1/16W	
R17	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R20	1-216-819-11	METAL CHIP	680	5% 1/16W	
R21	1-216-829-11	METAL CHIP	4.7K	5% 1/16W	
R22	1-216-829-11	METAL CHIP	4.7K	5% 1/16W	
R23	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R24	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R25	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R50	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R51	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R52	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R53	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R54	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R55	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	
R56	1-216-830-11	METAL CHIP	5.6K	5% 1/16W	
R57	1-216-831-11	METAL CHIP	6.8K	5% 1/16W	
R58	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R59	1-216-833-11	METAL CHIP	10K	5% 1/16W	
R60	1-216-839-11	METAL CHIP	33K	5% 1/16W	
		< VARIABLE RESISTOR >			
RV51	1-241-414-11	TUNING BLOCK (TUNING)			
RV53	1-238-094-11	RES, ADJ CERMET 220K (1.1V ADJ)			
		< SWITCH >			
S1	1-571-275-31	SWITCH, SLIDE (BAND)			
S2	1-571-506-41	SWITCH, SLIDE (TAPE/RADIO)			
S3	1-571-120-11	SWITCH, SLIDE (FM SENS)			
		< TRANSFORMER >			
T3	1-448-302-11	TRANSFORMER, DC-DC CONVERTER			
**********					
	--- WM-EX50 ONLY ---				
	1-809-282-11	DISPLAY PANEL BLOCK, LIQUID CRYSTAL			
		**********			
	1-638-314-11	FLEXIBLE BOARD, TUNER			
		< TERMINAL >			
TM501	3-367-808-01	TERMINAL (+), BATTERY			
TM502	3-367-809-01	TERMINAL BOARD (-), BATTERY			
**********					
		MISCELLANEOUS			
		**********			
334	1-638-313-11	PC BOARD, MOTOR FLEXIBLE			
HP901	1-543-812-11	HEAD, MAGNETIC (PLAYBACK)			
M901	1-541-660-11	MOTOR			
**********					

Ref. No.	Part No.	Description	Remark
		ACCESSORY & PACKING MATERIAL	
		**********	
	X-3329-657-1	ATTACHMENT ASSY (FOR MDR-E552) (EX50:AEP, UK, E)	
	1-528-221-21	BATTERY CHARGER (BC-7F) (US)	
	1-528-231-11	BATTERY, NICKEL CADMIUM (NC-6WM) (US, Canadian)	
	1-528-322-11	BATTERY CHARGER (BC-7AC) (Canadian)	
*	3-367-386-01	CUSHION (UPPER) (EX50)	
*	3-367-396-01	CUSHION (UPPER) (FX50)	
*	3-367-387-01	CUSHION (LOWER)	
*	3-367-384-01	INDIVIDUAL CARTON (EX50:US)	
*	3-367-388-01	INDIVIDUAL CARTON (EX50:AEP, UK)	
*	3-367-390-01	INDIVIDUAL CARTON (EX50:E)	
*	3-367-394-01	INDIVIDUAL CARTON (FX50:Canadian)	
*	3-367-398-01	INDIVIDUAL CARTON (FX50:US)	
*	3-367-400-01	INDIVIDUAL CARTON (FX50:AEP)	
*	3-367-401-01	INDIVIDUAL CARTON (FX50:E)	
	3-368-052-01	CASE, CARRYING (EX50)	
	3-368-053-01	CASE, CARRYING (FX50)	
	3-753-019-11	MANUAL, INSTRUCTION (FOR MDR-E552) (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX50:AEP, UK, E)	
	3-753-019-21	MANUAL, INSTRUCTION (ENGLISH) (EX50:US)	
	3-753-019-41	MANUAL, INSTRUCTION (FOR MDR-E552) (GERMAN, DUTCH, SWEDISH, ITALIAN) (EX50:AEP)	
	3-753-019-51	MANUAL, INSTRUCTION (FOR MDR-14) (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX50:AEP)	
	3-753-019-61	MANUAL, INSTRUCTION (FOR MDR-14) (GERMAN, DUTCH, SWEDISH, ITALIAN) (EX50:AEP)	
	3-753-020-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (FX50:AEP, E)	
	3-753-020-21	MANUAL, INSTRUCTION (ENGLISH) (FX50:US)	
	3-753-020-31	MANUAL, INSTRUCTION (FRENCH) (FX50:Canadian)	
	3-753-020-41	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (FX50:AEP)	
	8-953-341-90	HEADPHONE MDR-14 SET (US, AEP)	
	8-953-400-90	HEADPHONE MDR-E552 SET (AEP, UK, E, Canadian)	

ADJUSTMENTS

Mechanical measurements

Precaution

1. Clean the following parts with a denatured-alcohol-moistened swab :
   playback head pinch roller
   capstan rubber belts
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (1.3V) unless otherwise noted.

The following measurements are necessary when tape running problems are occured or repaired the tape transport mechanism.

Torque Measurement

Mode	Torque meter	Meter reading
FWD	CQ-102C	20 - 38 g-cm (0.28 - 0.52 oz-inch)
FWD Back Tension		0.5 - 4 g-cm (0.007 - 0.05 oz-inch)
REV	CQ-102RC	20 - 38 g-cm (0.28 - 0.52 oz-inch)
REV Back Tension		0.5 - 3.5 g-cm (0.007 - 0.05 oz-inch)
FF, REW	CQ-201B	More than 60 g-cm (more than 0.83 oz-inch)

Tape Tension Measurement

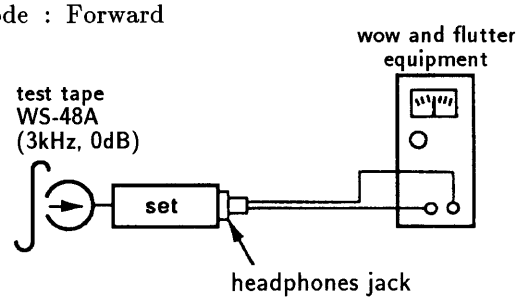
Mode	Torque meter	Meter reading
FWD	CQ-403A	More than 40 g-cm (more than 0.56 oz-inch)
RVS	CQ-403R	

W w and Flutter Measurement

procedure :

Function : Tape (WM-FX50)

Mode : Forward



Playback the center part of the test tape (WS-48A) and measure the wow and flutter at the unweighted position of the wow and flutter equipment.

Specification : Less than 0.6% rms (JIS)

Mechanical adjustments

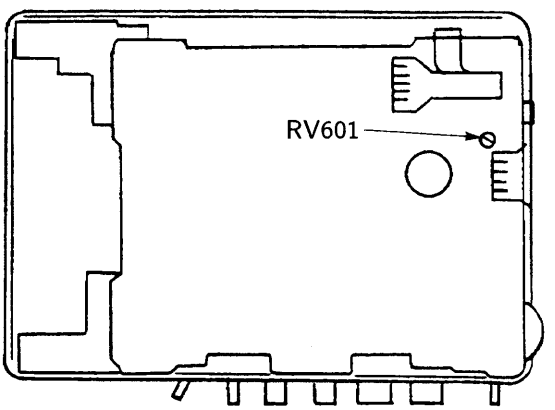
Precaution

- Supplied voltage : 1.3V
- Switch and control position
  DOLBY NR switch : OFF
  TAPE switch : NORM
  MEGA BASS switch : NORM
  VOLUME control : maximum

Tape section

Tape speed adjustment

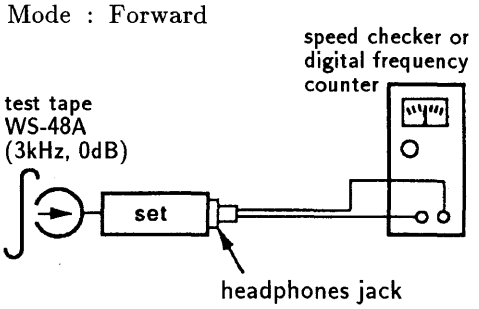
Adjustment Location



Procedure :

Function : TAPE

Mode : Forward



Playback the center part of the test tape (WS-48A) and adjust RV601 to obtain the tape speed to the following value.

Reading on speed checker	Reading on digital frequency counter
±1.0%	3,000Hz ± 30Hz

Specification :

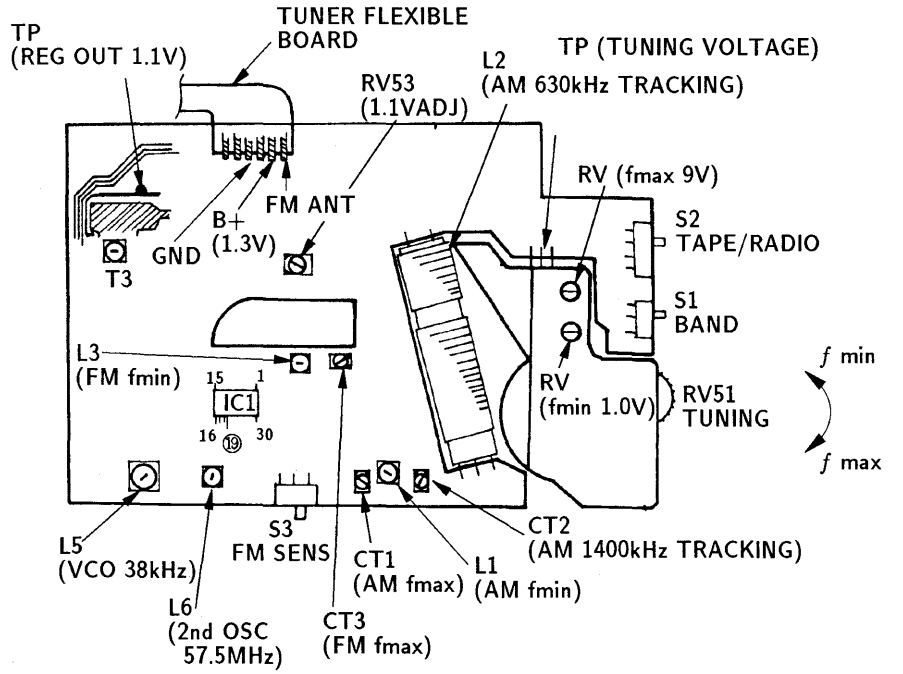
Frequency difference between the beginning and the end of test tape should be within ± 3% (± 90Hz) after adjusted the tape speed.

Electrical alignments

Tuner Section ONLY for WM-FX50

Adjustment Location

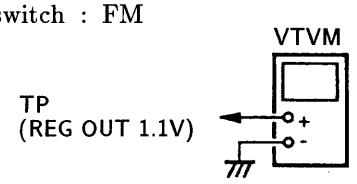
TUNER BOARD
— Component Side —



Power Supply Voltage Adjustment

Function switch : RADIO FM ST

Band switch : FM

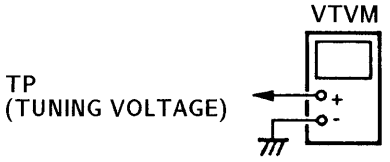


Adjustment part	Reading on VTVM
RV53	1.1 ± 0.01V

Tuning Voltage Adjustment

Function switch : RADIO FM ST

Band switch : FM



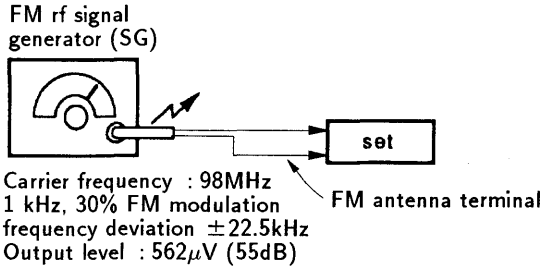
• Repeat the procedure in each adjustment several times since RV (f min) affects RV (f max) and RV (f max) affects RV (f min). This adjustment should end with the final adjustement of RV (f max).

Pointer position	Adjustment part	Reading on VTVM
f minimum	RV (fmin 1.0V)	1V±0.01V
f maximum	RV (fmax 9V)	9V±0.01V

Note :

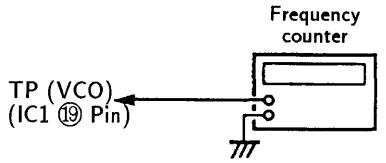
RV (f min), RV (f max) is built-in the RV51 block.

FM VCO Adjustment



Function switch : RADIO FM ST

Band switch : FM



• Tune the set to 98 MHz.

Adjustment part	frequency counter
L5	38kHz±0.02kHz

FM 2nd OSC Adjustment

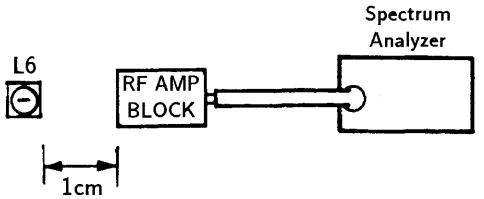
Function switch : RADIO FM ST

Band Switch : FM

Adjustment part : L6

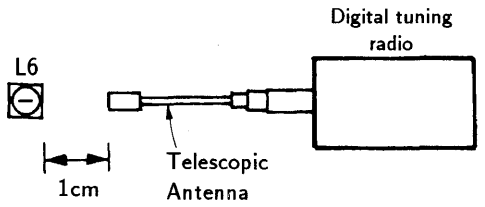
• How to adjust FM 2nd. oscillator useing the spectrum analyzer.

1. Prepared the spectrum analyzer and RF amplifier as shown in below drawing.
2. Set the switch to radio FM stereo position of WM-FX50.
3. Put the RF amplifeir block which connected to spectrum analyzer to just beside and one centi-meter away from L6.
4. Adjust L6 to bring up maximum waveform at 57.5 MHz position in spectrum analyzer.

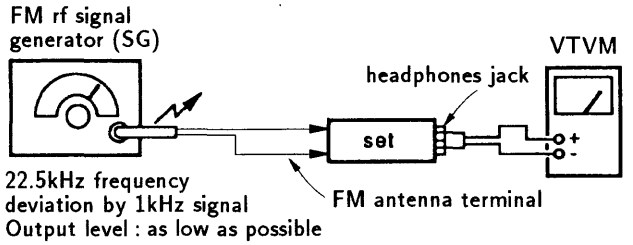


• How to adjust FM 2nd. oscillator if the spectrum analyzer is not available.

1. Prepared built-in SSB digital tuning radio such as SONY ICF-2001 or equivalents.
2. Tuned 57.5MHz ± 0.1MHz at the SSB mode of built-in SSB digital tuning radio.
3. Set the switch to radio FM stereo position of WM-FX50.
4. Put the telescopic antenna of built-in SSB digital tuning radio to just beside and one centi-meter away from L6 as show in below drawing.
5. Digital tuning radio will be reproduce peep sound.
6. Adjust L6 to fade out or minimize peep sound.



FM Frequency Coverage Adjustment



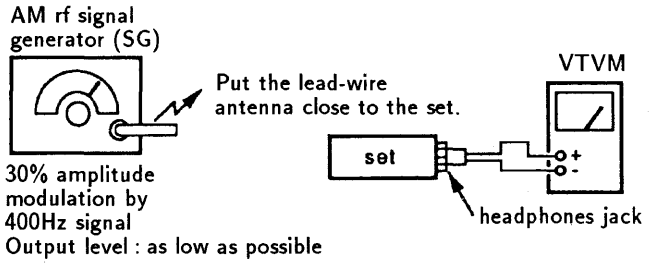
Function switch : RADIO FM ST

Band switch : FM

- Repeat the procedure in each adjustment several times since L3 affects CT3 and CT3 affects L3. This adjustment should end with the final adjustment of CT3.

Pointer position	SG frequency	Adjustment part	Reading on VTVM
f minimum	86.5 MHz	L3	maximum
f maximum	109.5 MHz	CT3	maximum

AM Frequency Coverage Adjustment



Function switch : RADIO FM ST

Band switch : AM

- Repeat the procedure in each adjustment several times since L1 affects CT1 and CT1 affects L1. This adjustment should end with the final adjustment of CT1.

Pointer position	SG frequency	Adjustment part	Reading on VTVM
f minimum	520kHz±3kHz	L1	maximum
f maximum	1680kHz±20kHz (1750kHz±20kHz)	CT1	maximum

no mark : except US, Canadian model
( ) : US, Canadian model

AM Tracking Adjustment

Function switch : RADIO FM ST

Band switch : AM

- Repeat the procedure in each adjustment several times since L2 affects CT2 and CT2 affects L2. This adjustment should end with the final adjustment of CT2.

NOTE :

Test equipment is settled as same as AM Frequency coverage adjsutment.

SG and set frequency	Adjustment part	Reading on VTVM
630kHz	L2	maximum
1400kHz	CT2	

Specifications

Radio (WM-FX50 only)
In Italy
FM : 87.5 - 108MHz
AM : 526.5 - 1,606.5kHz
In other countries
FM : 87.6 - 107.9MHz
AM : 531 - 1,602kHz

Power requirements
1.5V DC
One R6 (size AA) battery
Rechargeable battery
DC1.5V jack accepts
Sony AC-E15L AC power adaptor (not supplied) for use on :

AEP model	220V AC, 50Hz
E model	120V AC, 60Hz 220V AC, 50Hz
US, Canadian model	120V AC, 60Hz
UK model	240V AC, 50Hz

Power life
(Approximate hours)

	WM-FX50	
	Playback	FM
Sony Alkaline AM3 (N)	7 hrs.	30 hrs.
Rechargeable NC-6WM	3 hrs.	10 hrs.

Design and specifications subject to change without notice.

Note

This appliance conforms with ECC Directive 87/308/ECC regarding interference suppression.

Accessories supplied

○ : supplies × : not supplied

	Stereo headphones	Stereo earphones	Ear adaptors	Carrying case
Italian model	×	○	○	○
Other European model	○	×	×	○
Other model	×	○	○	○

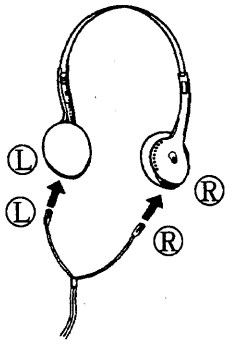
Lithium battery (1) ... WM-EX50 only

Note on stereo earphones (except other European model)

If the earphones do not fit your ears, attach the ear adaptors (supplied).

Note on stereo headphones (European model except Italian model).

The cord of the headphones is detachable. If the cord becomes detached, reconnect it as illustrated.



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